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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/559,403	04/26/2000	Yong Beom Kim	0214-0166P-SP	1204

7590 02/23/2006

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EXAMINER	
NGUYEN, HOAN C	
ART UNIT	**PAPER NUMBER**
2871	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/559,403	KIM, YONG BEOM	
	Examiner	Art Unit	
	HOAN C. NGUYEN	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 23-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 23-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's arguments with respect to claims 1-10 and 23-27 based on the Response filed on 1 March 2006 have been considered but are in the new ground(s) of rejection. Therefore, this is non-Final action.

A verified English translation of Foreign Priority has been acknowledged in last non-final Office Action. Because of submitted the English translation of Foreign Priority, examiner changed reference Choi into Park et al. and Okamoto et al.

Both Park et al. (US6411347B1) and the instant application are now commonly assigned at the time of invention. Therefore, reference of Song (US6091464A) or Stupp et al. (US5929463A) will replaced Park et al. for 103(a) rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

1. Claims 1-6 and 23-27 are rejected under 35 U.S.C. 103(a) as being obvious over Kubo et al. (US6295109B1) in view of **Song (US6091464A)**, Okamoto et al. (US6281952B1) and Moriyama et al. (US4017156).

In regard to claims 1-2, 6 and 23-26, Kubo et al. teach (Figs. 2-3 and 21) a transmission - reflection type liquid crystal display device comprising:

- a first transparent substrate 1;

- a second transparent substrate-2,
- a liquid crystal layer 5 between the first transparent substrate and the second transparent substrate;
- a linear polarizer 9 on the second transparent substrate;
- a circular polarizer (λ/4 wave plate 7) on an outer side of the first transparent substrate 1 according to claims 24 and 26;
- a reflecting film (reflective electrode region 3R) on an inner side of the first transparent substrate adjacent to the liquid crystal layer, the reflecting film defining a light-transmitting region (transmissive electrode region 8T), wherein, as Fig. 21 shown, the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflection film 61 in each pixel, an opposing side of said of reflecting film overlapping an adjacent gate line substantially.
- a λ/4 phase shift plate (λ/4 wave plate 10) between the linear polarizer 9 and the liquid crystal layer or second substrate 2; thus a circular polarizer (polarizer 9 and λ/4 wave plate 10) between the first substrate 1 and the backlight (col. 1 lines 30-35) according to claims 2 and 25.
- a transparent common electrode (transmisive electrode 4) between the linear polarizer 6 and the liquid crystal layer according to claim 6.

In regard to claim 3, Kubo et al. teach (Fig. 2) a transmission-reflection type liquid crystal display device, wherein when a voltage is not impressed on the liquid crystal

layer, the liquid crystal layer imparts or grants a phase shift of $\lambda/4$ to light transmitted through the liquid crystal layer since the retardation of liquid crystal 5 is zero when no voltage is applied (col. 10, lines 11-13).

In regard to claim 5, Kubo et al. teach (Figs. 2-3) a transmission-reflection type liquid crystal display device further comprising a color filter on the reflective and transmissive electrode regions (col. 25 lines 55-58), thereby between the linear polarizer and the liquid crystal layer.

However, Kobo et al. fail to disclose

- the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side entirely overlapping an adjacent gate line.
- a circular polarizer made of the cholesteric liquid crystal polarizer including a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is conventionally worked or performed with the visible light, which has wavelength of λ=380nm-800nm.

Song teaches (Figs. 1-2) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 10 and a side of outer edge

periphery of the pixel electrode 30 in each pixel, the opposite side **almost entirely** overlapping an adjacent gate line 10 for increasing the capacitance of a storage capacitor 70 in a liquid crystal display device to improve the image quality of an LCD device; thereby, it is obvious to further modify the opposite side to be **entirely** overlapping an adjacent gate line for maximizing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device. However, Song fails to disclose the pixel electrode to be reflection electrode.

Okamoto et al. teach (Fig. 1, col. 14 lines 45-49) a liquid crystal display device, in which the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means.

Moriyama et al. teach (col. 3 lines 1-14) a transmission-reflection type liquid crystal display device, wherein the circular polarizer (1/4 spectrum plate 3) includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is conventionally worked or performed with the visible light, which has wavelength of λ=380nm-800nm for clear and bright color having a high purity of the wavelength, therefore, improving visual effect.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with (a) the opposite side of the light

transmitting region to be **entirely** overlapping an adjacent gate line for increasing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device (col. 1 lines 25-26, 40-41 and 53-54); wherein the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means as taught by Okamoto et al. (col. 14 lines 45-49); (b) the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ=380-800nm for clear and bright color having a high purity of the wavelength, therefore, improving visual effect as taught by Moriyama et al. (col. 3 lines 1-14).

1. Claim 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al. (US6295109B1) in view of **Song (US6091464A)** and Okamoto et al. (US6281952B1).

In regard to claim 7, Kubo et al. teach (Figs. 21-22) a transmission-reflection type liquid crystal display device comprising

- a plurality of gate lines 53 and data lines 59a defining a plurality of pixels;
- a transistor in each pixel,
- a gate (gate electrode 52) of which is connected to a gate line and
- a second terminal (source electrode 59b) of which is connected to a data line;
- a reflecting film 61 formed in each pixel and connected to a third terminal (drain electrode 59c of the transistor in each pixel, an outer edge at a side of said reflecting film overlapping one of said gate lines substantially, while an outer

edge at an opposing side of said reflecting film does not overlap an inner edge of an adjacent gate line,

wherein

- a light-transmitting region (region T) through which light may pass is disposed between one of said gate lines and said outer edge of said reflecting film, which does not overlap an inner edge of said adjacent gate line.
- light-transmitting region (region T) exists between a data line adjacent to the data line connected to the second terminal of the transistor and the reflecting film in each pixel according to claim 8.
- the reflecting film overlaps (not entirely) the data line connected to the second terminal of the transistor in each pixel as Fig. 8A shown according to claim 9.
- the reflecting film overlaps (not entirely) a gate line adjacent to the gate line connected to the gate of the transistor in each pixel as Fig. 8A shown according to claim 10.

However, Kobo et al. fail to disclose the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side **entirely overlapping** an adjacent gate line.

Song teaches (Figs. 1-2) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 10 and a side of outer edge periphery of the pixel electrode 30 in each pixel, the opposite side **almost entirely**

overlapping an adjacent gate line 10 for increasing the capacitance of a storage capacitor 70 in a liquid crystal display device to improve the image quality of an LCD device; thereby, it is obvious to further modify the opposite side to be **entirely** overlapping an adjacent gate line for maximizing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device. However, Song fails to disclose the pixel electrode to be reflection electrode.

Okamoto et al. teach (Fig. 1, col. 14 lines 45-49) a liquid crystal display device, in which the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with the opposite side of the light transmitting region to be **entirely** overlapping an adjacent gate line for the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device by reducing flickering and other image defects as taught by Park et al. (in abstract); wherein the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means as taught by Okamoto et al. (col. 14 lines 45-49).

2. Claims 1-6 and 23-27 are rejected under 35 U.S.C. 103(a) as being obvious over Kubo et al. (US6295109B1) in view of **Stupp et al. (US5929463A)**, Okamoto et al. (US6281952B1) and Moriyama et al. (US4017156).

In regard to claims 1-2, 6 and 23-26, Kubo et al. teach (Figs. 2-3 and 21) a transmission - reflection type liquid crystal display device comprising:

- a first transparent substrate 1;
- a second transparent substrate-2,
- a liquid crystal layer 5 between the first transparent substrate and the second transparent substrate;
- a linear polarizer 9 on the second transparent substrate;
- a circular polarizer (λ/4 wave plate 7) on an outer side of the first transparent substrate 1 according to claims 24 and 26;
- a reflecting film (reflective electrode region 3R) on an inner side of the first transparent substrate adjacent to the liquid crystal layer, the reflecting film defining a light-transmitting region (transmissive electrode region 8T), wherein, as Fig. 21 shown, the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflection film 61 in each pixel, an opposing side of said of reflecting film overlapping an adjacent gate line substantially.
- a λ/4 phase shift plate (λ/4 wave plate 10) between the linear polarizer 9 and the liquid crystal layer or second substrate 2; thus a circular polarizer (polarizer 9 and

λ/4 wave plate 10) between the first substrate 1 and the backlight (col. 1 lines 30-35) according to claims 2 and 25.

- a transparent common electrode (transmisive electrode 4) between the linear polarizer 6 and the liquid crystal layer according to claim 6.

In regard to claim 3, Kubo et al. teach (Fig. 2) a transmission-reflection type liquid crystal display device, wherein when a voltage is not impressed on the liquid crystal layer, the liquid crystal layer imparts or grants a phase shift of λ/4 to light transmitted through the liquid crystal layer since the retardation of liquid crystal 5 is zero when no voltage is applied (col. 10, lines 11-13).

In regard to claim 5, Kubo et al. teach (Figs. 2-3) a transmission-reflection type liquid crystal display device further comprising a color filter on the reflective and transmissive electrode regions (col. 25 lines 55-58), thereby between the linear polarizer and the liquid crystal layer.

However, Kobo et al. fail to disclose

- the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side entirely overlapping an adjacent gate line.
- a circular polarizer made of the cholesteric liquid crystal polarizer including a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for

electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is conventionally worked or performed with the visible light, which has wavelength of λ=380nm-800nm.

Stupp et al. teaches (Fig. 1) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line (row electrode 12) and a side of outer edge periphery of the pixel electrode 10 in each pixel, the opposite side **almost entirely** overlapping an adjacent gate line 12 for providing the extra capacitor 29 in a liquid crystal display device to improve the a charge storage capacity; thereby, it is obvious to further modify the opposite side to be **entirely** overlapping an adjacent gate line for maximizing the extra capacitor to improve a charge storage capacity. However, Stupp fails to disclose the pixel electrode to be reflection electrode.

Okamoto et al. teach (Fig. 1, col. 14 lines 45-49) a liquid crystal display device, in which the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means.

Moriyama et al. teach (col. 3 lines 1-14) a transmission-reflection type liquid crystal display device, wherein the circular polarizer (1/4 spectrum plate 3) includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is conventionally worked or

performed with the visible light, which has wavelength of λ=380nm-800nm for clear and bright color having a high purity of the wavelength, therefore, improving visual effect.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with (a) the opposite side of the light transmitting region to be **entirely** overlapping an adjacent gate line for increasing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device (col. 1 lines 25-26, 40-41 and 53-54); wherein the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means as taught by Okamoto et al. (col. 14 lines 45-49); (b) the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ=380-800nm for clear and bright color having a high purity of the wavelength, therefore, improving visual effect as taught by Moriyama et al. (col. 3 lines 1-14).

2. Claim 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al. (US6295109B1) in view of **Stupp et al. (US5929463A)** and Okamoto et al. (US6281952B1).

In regard to claim 7, Kubo et al. teach (Figs. 21-22) a transmission-reflection type liquid crystal display device comprising

- a plurality of gate lines 53 and data lines 59a defining a plurality of pixels;

- a transistor in each pixel,
- a gate (gate electrode 52) of which is connected to a gate line and
- a second terminal (source electrode 59b) of which is connected to a data line;
- a reflecting film 61 formed in each pixel and connected to a third terminal (drain electrode 59c of the transistor in each pixel, an outer edge at a side of said reflecting film overlapping one of said gate lines substantially, while an outer edge at an opposing side of said reflecting film does not overlap an inner edge of an adjacent gate line,

wherein

- a light-transmitting region (region T) through which light may pass is disposed between one of said gate lines and said outer edge of said reflecting film, which does not overlap an inner edge of said adjacent gate line.
- light-transmitting region (region T) exists between a data line adjacent to the data line connected to the second terminal of the transistor and the reflecting film in each pixel according to claim 8.
- the reflecting film overlaps (not entirely) the data line connected to the second terminal of the transistor in each pixel as Fig. 8A shown according to claim 9.
- the reflecting film overlaps (not entirely) a gate line adjacent to the gate line connected to the gate of the transistor in each pixel as Fig. 8A shown according to claim 10.

However, Kobo et al. fail to disclose the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side **entirely overlapping** an adjacent gate line.

Stupp et al. teaches (Fig. 1) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line (row electrode 12) and a side of outer edge periphery of the pixel electrode 10 in each pixel, the opposite side **almost entirely** overlapping an adjacent gate line 12 for providing the extra capacitor 29 in a liquid crystal display device to improve the a charge storage capacity; thereby, it is obvious to further modify the opposite side to be **entirely** overlapping an adjacent gate line for maximizing the extra capacitor to improve a charge storage capacity. However, Stupp fails to disclose the pixel electrode to be reflection electrode.

Okamoto et al. teach (Fig. 1, col. 14 lines 45-49) a liquid crystal display device, in which the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with the opposite side of the light transmitting region to be **entirely** overlapping an adjacent gate line for the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of

an LCD device by reducing flickering and other image defects as taught by Park et al. (in abstract); wherein the reflection film 8 may be a reflective pixel electrode serving both as a liquid crystal driving electrode for driving the liquid crystal layer 1 and the reflecting means as taught by Okamoto et al. (col. 14 lines 45-49).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim H. Robert can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOAN C. NGUYEN
Examiner
Art Unit 2871

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ANDREW SCHECHTER
PRIMARY EXAMINER